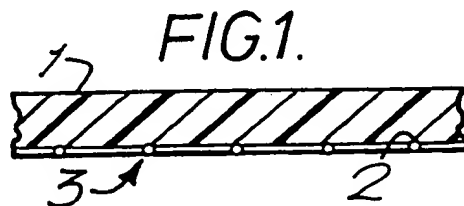


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(71) Applicant  
Ernst Spirig, P.O. Box 160,  
CH-8640 Rapperswil,  
Switzerland  
(72) Inventor  
Ernst Spirig  
(74) Agents  
A. A. Thornton & Co.,  
Northumberland House,  
303-306 High Holborn,  
London WC1V 7LE

(54) Dirt collecting mat

(57) A mat of plastics material having a tacky upper surface 1 to collect dirt, through having a high plasticiser content, has a reinforcing element 2 (such as a mesh or a woven textile) moulded into or onto its undersurface. The mat may then be glued or mechanically secured to a floor, table or the like without "walking" through the passage of traffic. The mat may be applied to a support sheet (9) and provided with a frame (6), being either glued to the support sheet or merely clamped by the frame (6). The frame and support sheet may form a mould in which the mat is moulded. The bottom of the mould may be roughened so that the plastics moulds to this, the mould bottom then forming the reinforcing element.



## SPECIFICATION

## Dirt collecting mat

5 This invention relates to a mat for placing on floors, assembly benches, laboratory tables, shelves or the like, the mat serving to collect dirt or bacteria and therefore keep the area free of dirt and bacteria.

It is known from British patent specification 1 475 366 to form a floor mat from PVC having a high content of plasticiser so that the surface of the mat is tacky and the dirt or bacteria on peoples' shoes or on trolley wheels will adhere to the surface of the mat. Such mats are laid on the floor at the entrance to an area which is to be kept free of dirt or bacteria, for example in hospitals, semiconductor plants and pharmaceutical plants. It is necessary to clean the mats reasonably frequently in order to maintain the dirt and bacteria absorbing properties, using water to which a detergent is added. However, if the mats are washed when in position on the floor where they are placed for use, the cleaning water seeps underneath the mats and the mats become slippery and therefore dangerous.

It would accordingly be an advantage to fix the mat to the floor. However, known methods do not work. Thus if the mat is glued over its underside to the floor, the downward pressures from passing traffic are converted strongly into horizontal shear force components, owing to the plasticity of the mat, and these shear forces quickly break down the adhesive bond between the mat and floor. If instead a frame (for example a metal frame) is placed around the mat and secured to the floor, thus clamping the mat around its periphery, the elasticity of the mat causes it to "walk" relative to the floor, in response to passing traffic, just as a carpet rug is liable to "walk" on a floor. This is especially pronounced under the pressure of trolley wheels. The mat therefore slips from the frame. If nails or screws pass through the frame, through the mat and into the floor, these provide a degree of holding but the mat will tear from them in due course.

In accordance with this invention, there is provided a mat of plastics material having a tacky upper surface and having a reinforcing element moulded into or onto its undersurface. In one embodiment, the reinforcing element may comprise woven textile material having an open weave or a mesh, for example of textile, in either case moulded into or onto the mat undersurface so as to be embedded partially or wholly into the mat material. In another embodiment, the reinforcing element may comprise a plate, for example of aluminium, having a roughened surface onto which the mat is moulded. In both embodiments, a reinforcing element may also be provided for the upper surface of the mat, for example a textile material mesh or a woven textile, with open weave moulded into or onto the upper surface.

The mat with woven or mesh reinforcing element in or on its undersurface may be glued to the floor

and the reinforcing element prevents downward pressures being converted into strong horizontal shear forces. Accordingly, the adhesive bond between the mat and the floor will be maintained and no water can seep under the mat to cause slipperiness. If gluing on site is not desired, then the mat may be glued in the factory to a support for example a metal sheet, which is then secured to the floor by screws or other mechanical devices. Instead of gluing, the mat with woven or mesh reinforcing element in or on its undersurface may be secured to the floor by a frame extending around the periphery of the mat. Equally, it may be secured in the factory by such a frame, and without gluing, to the metal sheet support.

The mat with woven or mesh reinforcing element in or on its undersurface may be laid over a layer of plastics with extremely high plasticiser content. There is then a constant migration of plasticiser into the mat and towards its upper surface in order to compensate for loss of plasticiser from the upper surface by cleaning. In a modification, the mat may be laid on top of a stack of such layers, these layers having progressively higher plasticiser contents in the downwards direction (away from the tacky upper surface of the mat).

A peripheral frame may be combined with a bottom support, such as a metal sheet, to form a mould into which the basic chemical mixture (polyvinyl chloride, plasticiser and stabiliser) is poured, whereafter the whole is heated to polymerise the plastics mat. The woven or mesh reinforcing element may be laid on the floor of the mould before the chemical mixture is poured in, or instead the bottom support may be sandblasted or otherwise roughened and thus itself form the reinforcing element, to which the plastics mat undersurface will become moulded and well adhered.

Embodiments of this invention will now be described, by way of examples only, with reference to the accompanying drawings, in which:

FIGURE 1 is a section through a portion of a first mat;

FIGURE 2 is a section through a portion of a second mat;

FIGURE 3 is an underside view of a portion of a third mat;

FIGURE 4 is an underside view of a portion of a fourth mat;

FIGURE 5 is a section showing a mat glued to a floor;

FIGURE 6 is a similar section through a mat secured to a floor by a peripheral frame;

FIGURE 7 is a section through a mat glued to a support sheet laid on a floor;

FIGURE 8 is a section through a mat glued to a support sheet and provided with a peripheral frame;

FIGURE 9 is a section through a mat clamped to a support frame by a peripheral frame;

FIGURE 10 is an enlarged section through the junction of two mats laid in series;

FIGURE 11 is a section through a modification of

Figure 9; and

FIGURE 12 is a section through a mould in which and to which a mat is moulded.

- Figures 1 to 4 show PVC plastics mats having a high plasticiser content so that the upper surface 1 of each mat is tacky and therefore collects dirt or bacteria. A reinforcing element 2 is moulded into or onto the undersurface 3 of each mat. Figure 1 shows the reinforcing element partially embedded, thus partially projecting from the undersurface. Figure 2 shows the reinforcing element wholly embedded in the mat material but closely adjacent the undersurface of the mat. In both Figure 1 and Figure 2, the reinforcing element comprises a mesh, for example of metal or of textile material, or a woven textile with open weave. Figure 3 shows an example of a wide mess of textile material but, because this leaves the mat still rather flexible, a closer mesh or the woven textile is preferred, as shown in Figure 4. The mats of Figures 1 to 4 are formed by placing the reinforcing element on the bottom of a mould and then pouring the liquid chemical mixture of PVC plasticiser and a stabiliser into the mould and thereafter polymerising the plastics by applying heat to the mould, whereby the reinforcing element becomes moulded into or onto the undersurface of the mat.

- As shown in Figure 5, the mat of any one of Figures 1 to 4 may be glued to a floor 4 (the layer of glue being indicated by reference 5). Instead, as shown in Figure 6, the mat of any one of Figures 1 to 4 may be mechanically secured to the floor by a peripheral frame 6 which is itself secured to the floor by screws 7 and which clamps the mat around its periphery.

- As shown in Figure 7, the mat of any one of Figures 1 to 4 may be glued in the factory to a support, for example an aluminium sheet 9, the glue being shown at 8. This mat is then secured to the floor by screws 10. As shown in Figures 8 and 9, the mat may be applied in the factory to a support 9, such as an aluminium sheet, provided with a peripheral frame 6 which clamps the mat around its periphery. In Figure 8, the mat is glued to the support (see glue layer 8), whilst in Figure 9 no glue is used but the mechanical clamping of the frame is supplemented by spikes 11 projecting upwards from the support beneath the overlying rim 6a of the frame.

- A plurality of the framed mats as shown in any one of Figures 6, 8 and 9 may be laid in series or alongside each other on the floor and Figure 10 shows the junction between two such mats. The chamfered surface 12 on the frame is provided to ease pushing a trolley onto or off the mats and Figure 10 shows a metal fillet 13 shaped to fill the resulting groove between two adjacent mats, the fillet 13 and the two frames being secured to the floor by screws 7.

- The framed mats might be conveniently 1 by 1 metre squares or 1 by 2 metres, for example.

- As shown in Figure 11, a mat of any one of Figures 1 to 4 may be laid over a layer 14 of PVC having extremely high plasticiser content (or over a stack of such layers, of progressively higher plasticiser content in the downwards direction). In Figure 11, the mat and layer 14 are shown laid on a support 9 which is integral with a frame 6 which clamps the mat around its periphery.

- Figure 12 shows a combined frame and support which forms a mould in which the mat of any one of Figures 1 to 4 may be directly moulded. In use, firstly the reinforcing element is placed on the bottom of mould (and may be mechanically secured in position), after which the chemical mixture of PVC, plasticiser and stabiliser is poured into the mould, whereafter the whole is heated to effect polymerisation within the mould. Alternatively, the bottom of the mould (i.e. upper surface of the support sheet) may be sandblasted or otherwise roughened as indicated at 15 so that it forms itself the reinforcing element which thus becomes moulded onto the undersurface of the mat (the eventual upper surface 1 of which is shown in outline).

- Whilst the mats have been described in connection with floors, they may also be used on benches, tables or shelves or the like. The mats can be cleaned easily in-situ with detergent water and dried with a water tolerant vacuumiser having an appropriate rubber nozzle.

#### CLAIMS

1. A mat of plastics material having a tacky upper surface and having a reinforcing element moulded into or onto its undersurface.
2. A mat as claimed in claim 1, in which the reinforcing element comprises a woven textile material having an open weave.
3. A mat as claimed in claim 1, in which the reinforcing element comprises a mesh.
4. A mat as claimed in any preceding claim, in which the reinforcing element is moulded into the plastics so as to be partially embedded in and partially projecting from said undersurface.
5. A mat as claimed in any one of claims 1 to 3, in which the reinforcing element is moulded into the plastics so as to be wholly embedded in the mat material closely adjacent said undersurface.
6. A mat as claimed in any preceding claim, glued over its undersurface to a floor, bench, table or shelf.
7. A mat as claimed in any one of claims 1 to 5, mechanically secured to a floor, bench, table or shelf by a peripheral frame which clamps the mat around its periphery.
8. A mat as claimed in any one of claims 1 to 5, glued over its undersurface to a support sheet.
9. A mat as claimed in any one of claims 1 to 5, mechanically secured to a support sheet by a peripheral frame which clamps the mat around its periphery.
10. A mat as claimed in claim 9, in which the mat is laid over a layer of plastics having a higher plasticiser content.
11. A mat as claimed in claim 1, in which said reinforcing element comprises a support element having a roughened upper surface to which the mat has become adhered by moulding thereon.
12. A mat of plastics material substantially as herein described with reference to any one of the accompanying drawings.
13. A method of forming a mat of plastics material having a tacky upper surface, comprising placing a reinforcing element on the bottom of a mould, pouring a plastics mixture into the mould and

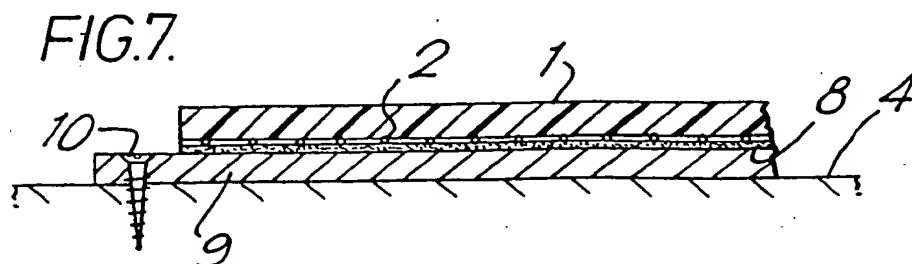
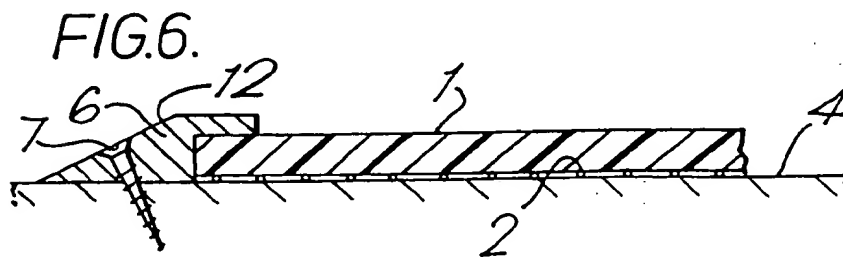
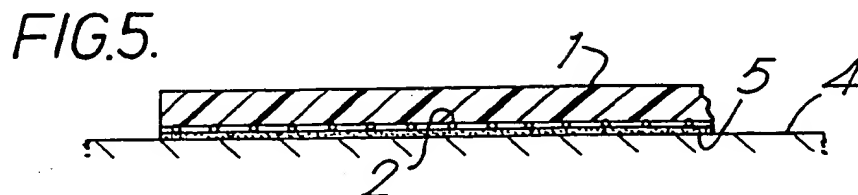
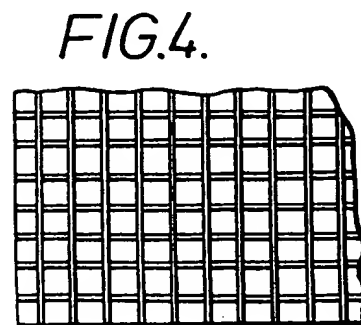
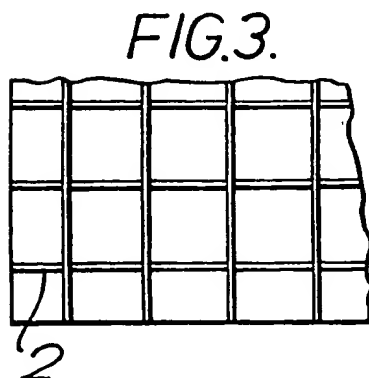
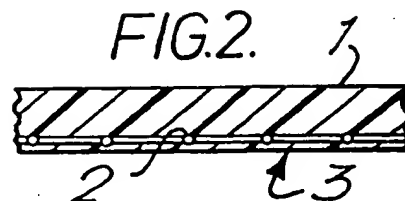
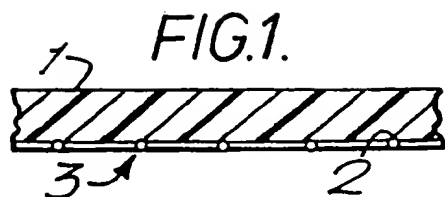
polymerising the plastics in the mould so that the reinforcing element becomes moulded onto or into the undersurface of the mat.

14. A method of forming a mat of plastics material having a tacky upper surface, comprising providing a support element having a roughened upper surface and a peripheral frame to form a mould, pouring a plastics mixture into the mould and polymerising the plastics in the mould so that the support element becomes moulded onto the undersurface of the mat.

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FIG.8.

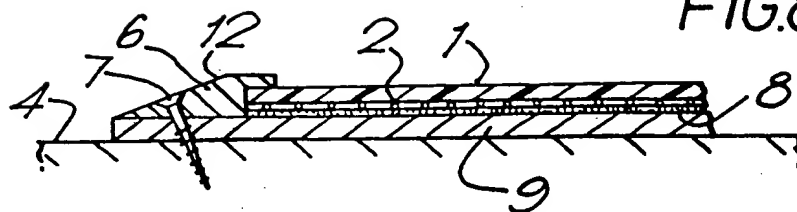


FIG.9.

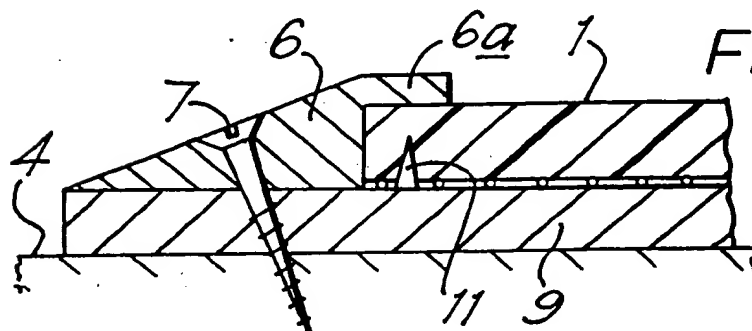


FIG.10.

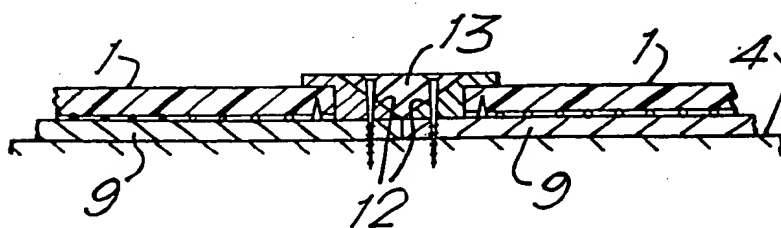


FIG.11.

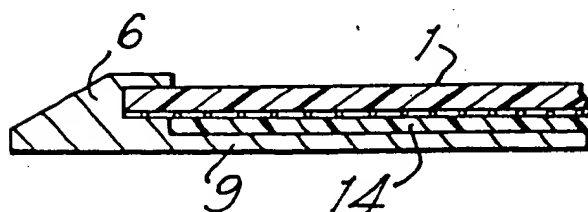


FIG.12.

